

mines the basis for the correction from the normal to be allowed.

4. The difference, if any, during the last preceding crest, between actual gage heights at lower stations and the expected heights at such stations must be considered and an allowance, corresponding to such difference, if any, made in the forecast.

5. If the combined discharge of the Grand, Green, and San Juan is in excess of 120,000 second-feet the time interval from these stations is one day longer for the crest at Topock and two days for the crest at Yuma.

6. There is generally a heavy run-off from the middle division before active melting sets in in the upper division, and accordingly from 10,000 to 20,000 second-feet are added to the upstream discharge in April and the early part of May, the amount depending on the preceding season's snowfall.

7. The time interval from the middle division to the stations in the lower division is four or five days.

8. When one crest follows another, the intervening period being too short for the submerged lands to drain, the time interval from the upper division to the lower division is reduced one or two days.

FALLING RIVER.

When falling stages occur in the upper reaches they are due to cooler weather or to the fact that the season's maximum of melting of snow has passed. The lower river falls rapidly as soon as the crest has passed. It is not unusual for the decline to equal 30,000 second-feet the first day and 20,000 second-feet the second and third days.

TABLE 1.—Rating table¹ for Green River at Elgin, Utah, near Green River, Utah.

Gage height.	Discharge.	Difference.	Gage height.	Discharge.	Difference.	Gage height.	Discharge.	Difference.
<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
6.00	3,300	300	9.40	18,900	600	12.80	43,600	800
6.10	3,600	300	9.50	19,500	600	12.90	44,400	800
6.20	3,900	300	9.60	20,100	600	13.00	45,200	800
6.30	4,200	300	9.70	20,700	600	13.10	46,000	800
6.40	4,500	300	9.80	21,300	600	13.20	46,800	800
6.50	4,800	300	9.90	21,900	700	13.30	47,600	800
6.60	5,100	320	10.00	22,500	700	13.40	48,400	800
6.70	5,420	340	10.10	23,100	700	13.50	49,200	800
6.80	5,760	360	10.20	23,700	700	13.60	50,000	800
6.90	6,120	380	10.30	24,300	700	13.70	50,800	800
7.00	6,500	400	10.40	24,900	700	13.80	51,600	800
7.10	6,900	420	10.50	25,500	700	13.90	52,400	800
7.20	7,320	420	10.60	26,100	700	14.00	53,200	800
7.30	7,740	440	10.70	26,700	700	14.10	54,000	800
7.40	8,180	440	10.80	27,300	700	14.20	54,800	800
7.50	8,620	460	10.90	27,900	700	14.30	55,600	800
7.60	9,080	460	11.00	28,500	700	14.40	56,400	800
7.70	9,540	460	11.10	29,100	700	14.50	57,200	800
7.80	10,000	500	11.20	29,700	700	14.60	58,000	800
7.90	10,500	500	11.30	30,300	700	14.70	58,800	800
8.00	11,000	500	11.40	30,900	700	14.80	59,600	800
8.10	11,500	500	11.50	31,500	800	14.90	60,400	800
8.20	12,000	500	11.60	32,100	800	15.00	61,200	800
8.30	12,500	500	11.70	32,700	800	15.10	62,000	800
8.40	13,000	500	11.80	33,300	800	15.20	62,800	800
8.50	13,500	500	11.90	33,900	800	15.30	63,600	800
8.60	14,000	600	12.00	34,500	800	15.40	64,400	800
8.70	14,700	600	12.10	35,100	800	15.50	65,200	800
8.80	15,300	600	12.20	35,700	800	15.60	66,000	800
8.90	15,900	600	12.30	36,300	800	15.70	66,800	800
9.00	16,500	600	12.40	36,900	800	15.80	67,600	800
9.10	17,100	600	12.50	37,500	800	15.90	68,400	800
9.20	17,700	600	12.60	38,100	800			
9.30	18,300	600	12.70	38,700	800			

¹ The above table is not applicable for ice or obstructed channel conditions. It is based on three discharge measurements made during 1910 and the form of previous curves; one discharge measurement being made June 13, 1909, gage 15.15 feet, and is not well defined.

TABLE 2.—Rating table for Grand River near Fruita, Colo.

Gage height.	Discharge.	Difference.	Gage height.	Discharge.	Difference.	Gage height.	Discharge.	Difference.
<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>	<i>Feet.</i>	<i>Sec.-ft.</i>	<i>Sec.-ft.</i>
3.00	3,010	140	7.00	12,400	350	11.00	34,500	720
3.10	3,150	150	7.10	12,750	360	11.10	35,220	720
3.20	3,300	150	7.20	13,110	360	11.20	35,940	720
3.30	3,450	160	7.30	13,470	360	11.30	36,660	720
3.40	3,610	160	7.40	13,830	360	11.40	37,380	720
3.50	3,770	170	7.50	14,200	400	11.50	38,100	740
3.60	3,940	170	7.60	14,600	420	11.60	38,840	740
3.70	4,110	180	7.70	15,020	440	11.70	39,580	740
3.80	4,290	180	7.80	15,460	460	11.80	40,320	740
3.90	4,470	190	7.90	15,920	480	11.90	41,060	740
4.00	4,660	190	8.00	16,400	480	12.00	41,800	740
4.10	4,850	200	8.10	16,880	500	12.10	42,540	740
4.20	5,050	200	8.20	17,380	500	12.20	43,280	740
4.30	5,250	200	8.30	17,880	520	12.30	44,020	740
4.40	5,450	210	8.40	18,400	520	12.40	44,760	740
4.50	5,660	210	8.50	18,920	520	12.50	45,500	740
4.60	5,870	210	8.60	19,440	520	12.60	46,240	740
4.70	6,080	220	8.70	19,960	540	12.70	46,980	740
4.80	6,300	220	8.80	20,500	540	12.80	47,720	740
4.90	6,520	220	8.90	21,040	540	12.90	48,460	740
5.00	6,740	230	9.00	21,580	560	13.00	49,200	740
5.10	6,970	230	9.10	22,140	560	13.10	49,940	740
5.20	7,200	230	9.20	22,700	580	13.20	50,680	740
5.30	7,430	240	9.30	23,280	580	13.30	51,420	740
5.40	7,670	240	9.40	23,860	600	13.40	52,160	740
5.50	7,910	250	9.50	24,460	600	13.50	52,900	740
5.60	8,160	250	9.60	25,060	620	13.60	53,640	740
5.70	8,410	260	9.70	25,680	620	13.70	54,380	740
5.80	8,670	260	9.80	26,300	640	13.80	55,120	740
5.90	8,930	270	9.90	26,940	640	13.90	55,860	740
6.00	9,200	280	10.00	27,580	660	14.00	56,600	740
6.10	9,480	290	10.10	28,240	660	14.10	57,340	740
6.20	9,770	300	10.20	28,900	680	14.20	58,080	740
6.30	10,070	310	10.30	29,580	680	14.30	58,820	740
6.40	10,380	320	10.40	30,260	700	14.40	59,560	740
6.50	10,700	330	10.50	30,960	700	14.50	60,300	740
6.60	11,030	330	10.60	31,660	700	14.60	61,040	740
6.70	11,360	340	10.70	32,380	720	14.70	61,780	740
6.80	11,700	350	10.80	33,100	720	14.80	62,520	740
6.90	12,050	350	10.90	33,840	720	14.90	63,260	740

WATER SUPPLY IN CALIFORNIA.

By ANDREW H. PALMER.

[Abstract: Journal of Geography, New York, Vol. xviii, No. 2 (Feb., 1919.)]

The author discusses both the present and the future water supply problem, with special reference to California.

The effect of the great latitude and topographic variation in the State is very marked on the rainfall—the real source of water power. The rainfall of California¹ presents some astounding contrasts. In the Mohave Desert, for example, the average annual precipitation is only 1 to 2 inches, while in portions of the Sierra Nevadas the annual amount exceeds 100 inches.

It has been found that in the central Sierras up to 5,000 feet elevation the average annual rainfall increases at the rate of 8.5 inches for each 1,000 feet.² Fortunately, much of the precipitation at the higher elevations is in the form of snow, thereby storing up water for power and irrigation purposes during the long rainless summers so characteristic of the Pacific coast States.

After taking up the natural controls of water power, namely, climate, topography, geology, vegetation, and artificial agencies (dams, reservoirs, etc.), the writer gives a brief history of hydro-electric development in California.

In conclusion, he discusses water power in relation to irrigation, flood control, and city water supply.

Thus, it is quite evident that of all the principal factors entering into the problem of water power and supply, climate, particularly precipitation, demands the first consideration.—H. L.

¹ See McAdie, A. G., *The Rainfall of California*, Univ. of Cal. pubs. in Geography, Berkeley, Calif., vol. 1, No. 4, February, 1914.

² Henry, A. J.: Increase of precipitation with altitude, *MONTHLY WEATHER REVIEW*, January, 1919, 47: 33-41. (2 figs.)